

PATENT NO. 70,119
DESCRIPTION
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STOCKHOLM SUPER PHOSPHATE CO., INC.
STOCKHOLM

METHOD OF PRODUCING A MIXTURE OF AMMONIUM NITRATE
AND AMMONIUM SULFATE IN GRANULAR FORM.

Inventor: J. Gelhaar

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[stamp:]

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As is known, ammonium nitrate is particularly hygroscopic, a property that makes the salt difficult to store and spread. Even when mixed with ammonium sulfate, the nitrate has the same properties, although to a somewhat lesser degree. In order to diminish this hygroscopic property to some extent, several methods have been suggested for producing ammonium nitrate in granular form, for example, by blowing a hot, highly concentrated solution in finely dispersed form through a spray nozzle. People have also melted a mixture of ammonium nitrate and ammonium sulfate and thereafter crushed the hardened melt to a suitable grain size. In attempts to blow a molten mixture of ammonium nitrate and sulfate through a spray nozzle, it has been possible to accomplish this to produce small, round and very stable grains, but this procedure has proved to be very risky. When the melt is heated for some time, its temperature suddenly begins to rise rapidly and within a short time the entire melt converts to gaseous form. Continued investigations have shown that this decomposition is dependent upon temperature, time of heating and upon the quantity heated. It has thus been determined that a small quantity can be heated for a longer time at a certain temperature, for example, 250°C, than can a larger quantity. To heat a large quantity of the mixture above its melting point and then gradually blow it out through a nozzle is, however, so risky that such a method is scarcely usable in practice.

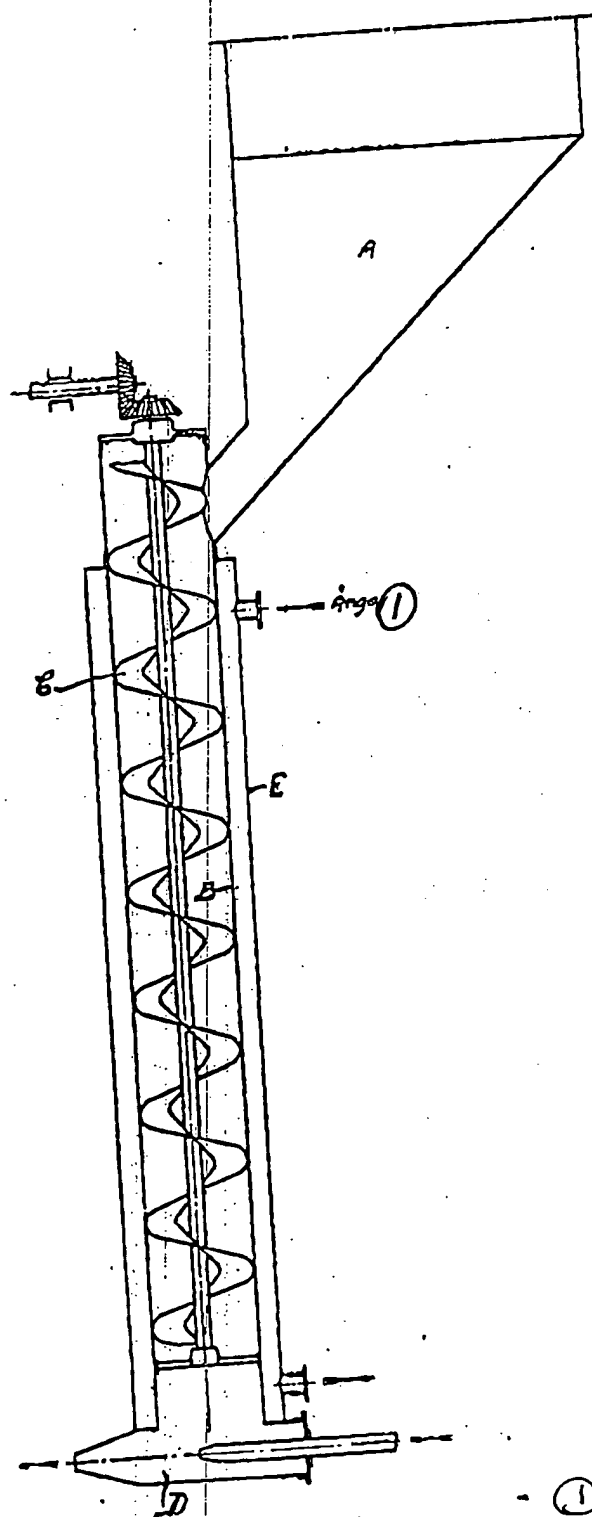
According to the present invention, this risk can be avoided by allowing the solid mixture to be fed gradually into a vessel that is externally heated, for example, with steam, to a temperature that exceeds the melting point of the mixture (approximately 180-250°C, depending upon the composition of the mixture) and by blowing the melt out through a suitable dispersion means, for example, an ordinary spray nozzle or several such nozzles. If the procedure is carried out in this way the reaction that eventually leads to decomposition never has time to take place, so that the procedure can be applied in practice without risk.

An example of the implementation of the procedure will be described in the following, to which description is attached a schematic drawing showing the equipment. A constitutes the lower portion of a larger container for a mixture of equal parts of powdered ammonium nitrate and sulfate which is attached to a tube B. The mixture is fed by means of a screw C down through the tube B, which is provided with a steam jacket E so that it can be heated from the outside by steam to a temperature of approximately 200°C, at which temperature the mixture melts. As this takes place, the molten mixture is sprayed out through a nozzle D in the lower end of the tube, by which means the mixture is obtained in the form of small drops, which immediately harden into small, smooth and very stable granules.

In order to make the mixture easier to melt, one can add some water, but at most 10%, if the mixture does not already have such a water content.

Claims

1. Method of producing a mixture of ammonium nitrate and ammonium sulfate in granular form, characterized in that the powdered mixture is gradually fed down into a vessel that is heated to somewhat above the melting point of the mixture, and that the mass as it melts is pressed out therefrom through a spray nozzle or other suitable means for fine dispersion.
2. Embodiment of such a method according to Claim 1, characterized in that the mixture, as it is fed down into the vessel, is provided with at most 10% water or has at most this water content.



Stockholms Superfosfat Fabriks AB
Stockholm

Key: 1 Steam